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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/493,710

01/28/2000

Gadi Lenz

Lenz 9-12

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12/20/2004

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EXAMINER

BELLO, AGUSTIN

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 12/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/493,710

Applicant(s)

LENZ ET AL.

Examiner

Agustin Bello

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/22/04 has been entered.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-15 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 6,289,151 in view of Harvey. Although the conflicting claims are not identical, they are not patentably distinct from each other because the patent and the application claim an all-pass optical filter comprising an input port and an output port, a splitter/combiner, a feedback path, and a plurality of ring resonators. Although the instant application and the patent are not identical, they claim essentially the same invention. The application claims that the all-pass filter is configured to

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apply a plurality of frequency-dependent time delay periods to the input optical pulse to define a time delay spectrum having a plurality of delay peaks, and the free spectral range of the filter as defined by the spacing between the delay peaks is matched to the regular repetition rate of the input optical pulse. The specification of the application (page 6 lines 8-21) states that the result of the above limitation is the correction of certain dispersion of a pulsed laser which occurs when input optical pulse repeatedly circulates along a feedback path and interferes with itself (page 7 lines 18-20), but preserves the amplitude of the signal (page 10 lines 21-24). The patent claims that the all-pass filter, constructed of the same components as that of the application, corrects dispersion in a pulsed signal by returning the signal to a feedback path to interfere with light in the dispersed pulse thereby compensating dispersion in the pulse while substantially preserving the amplitude of each frequency in the pulse. Furthermore, it is well known in the art that the application of heat to a path can change the free spectral range of the group delay and the desired phase. Also, Harvey, in the same field of endeavor, teaches that creating a plurality of time delay periods to that are in synch with the repetition rate of the input pulse is well known in the art. Both the application and the patent claim an all pass optical filter arranged in parallel with a Mach-Zehnder interferometer (e.g. called Mach-Zehnder in the application, and called a plurality of ring resonators arranged as a series of coupled rings in the patent claim 5).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1-10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harvey in the article "Harmonically mode locked fiber ring laser with an internal Fabry-Perot stabilizer for soliton transmission."

Regarding claims 1 and 14, Harvey teaches an article comprising an all-pass optical filter including an input port for receiving an input optical pulse having a regular repetition rate (e.g. 2.5 GHz); an output port; a splitter/combiner a path and a all-pass filter (as seen in Figure 1); wherein the all-pass optical filter is configured to apply a plurality of frequency-dependent time delay periods to the input optical pulse to define a time delay spectrum having a plurality of delay peaks (as seen in Figure 2), and the free spectral range of the filter as defined by the spacing between the delay peaks is matched to the regular repetition rate of the input optical pulse (page 107, first column, second paragraph). Harvey differs from the claimed invention in that Harvey fails to specifically teach a feedback path wherein the all-pass optical filter is configured. Instead, Harvey employs the use of a feedforward design and produces the same result as the claimed invention. One skilled in the art would clearly have recognized that either a feedback or a feedforward design would have produced the same results so long as the two signals interfered with one another at a designated point along the loop formed by the option selected. One skilled in the art would have been motivated to select the feedback design option in the interest of size, cost, or compatibility with an established system. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have used a feedback path in order to produce the same results as the feedforward loop design taught by Harvey.

Regarding claim 2, as discussed above a feedback path would have been obvious, and the path of Harvey comprises a ring resonator (as seen in Figure 1) and a heating element for heating

a section of the ring resonator (e.g. resistive element described page 108, second column, first paragraph).

Regarding claim 3, Harvey teaches the all-pass optical filter of claim 1 arranged in parallel with a Mach-Zehnder interferometer. (e.g. modulator in Figure 1).

Regarding claim 4, Harvey teaches the all-pass optical filter of claim 1 in which the free-spectral range of the filter is matched to the repetition rate of the pulse train by the free spectral range being equal to the repetition rate (page 107, first column, second paragraph).

Regarding claim 5, Harvey teaches An assembly for use in an optical communication system comprising an optical multiplexer/demultiplexer device including the all-pass optical filter of claim 4 (inherent in the experiment described on page 109).

Regarding claim 6, Harvey teaches the all-pass optical filter of claim 1, in which the free-spectral range of the filter is matched to the repetition rate of the pulse train by the free spectral range being offset from the repetition rate by a sufficiently small degree that each frequency of the pulse train falls within a bandwidth of one of the plurality of delay peaks (as seen in Figure 2).

Regarding claim 7, Harvey teaches an assembly for use in an optical communication system comprising a pulsed laser (2.5 GHz OSC of Figure 1) and the all-pass optical filter (e.g. Fabry-Perot of Figure 1) of claim 6, in which the all-pass optical filter corrects linear chirp of the pulsed laser (as described in the abstract).

Regarding claims 8-10, Harvey teaches the communication system claimed (Figure 1).

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Harvey.

Regarding claim 11, Harvey teaches a method of generating a tunable delay for an optical signal with use of a single-stage all-pass optical filter wherein the pulse train of the optical signal has a regular repetition rate, the method comprising matching the spacing between the frequency-dependent time delay peaks generated by the all-pass optical filter to the repetition rate of the pulse train (Figure 1) (Figure 2).

Regarding claim 12, Harvey teaches the method of claim 11, in which the free-spectral range of the filter is matched to the repetition rate of the pulse train by the free-spectral range being equal to the repetition rate (page 107, first column, second paragraph).

Regarding claim 13, Harvey teaches the method of claim 11, in which the free-spectral range of the filter is matched to the repetition rate of the pulse train by the free-spectral range being offset from the repetition rate by a sufficiently small degree that each frequency of the pulse train falls within a bandwidth of one of the plurality of delay peaks. (as seen in Figure 2).

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***Response to Arguments***

8. Applicant's arguments filed 11/22/04 have been fully considered but they are not persuasive. First, the applicant argues that the Obviousness-Type Double Patenting rejection has been overcome by the applicant's amendment of claim 1 to recite a "single" feedback path.

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However, the examiner disagrees. The examiner maintains that it the recited limitation would have been obvious to one skilled in the art being that Kazarinov recites “at least one feedback path.” Clearly, this “at least one feedback path” could have been the “single” feedback path. The other limitations cited by the applicant as distinguishing over the prior art, e.g. 2) and 3) are met by the combination of Kazarinov and Harvey, and more particularly the disclosure of Harvey. Having met all the limitations of the claimed invention with the combination of Kazarinov and Harvey, the examiner maintains the Obviousness-Type Double Patenting rejection.

Next, the applicant argues that Harvey’s disclosure of a Fabry-Perot filter cannot be interpreted as the all-pass filter of the claimed invention. Specifically, the applicant contends that by definition, Fabry-Perot etalons are not all-pass filters and that those skilled in the art know the difference between the two. However, the examiner disagrees. Fabry-Perot filters can indeed be configured as all-pass filters. For example, Sugden (U.S. Patent Application Publication No. 2003/0210864) specifically discloses a Fabry-Perot filter which is configured as an all-pass filter (paragraph [0103]). Likewise, Ip (U.S. Patent No. 5,557,468) discloses a Fabry-Perot filter configured as an all-pass filter (column 3 lines 35-39). Most telling, the applicant’s themselves consider a Fabry-Perot filter as an all-pass filter (second column, first paragraph of the applicant’s admitted prior art “Optical All-Pass Filters for Phase Response Design with Applications for Dispersion Compensation” authored by the applicants). Clearly, and with all due respect, it is apparent that the applicant has misconstrued the function of a Fabry-Perot etalon. Accordingly, it is clear that the limitations of the claimed invention are met in that Harvey teaches an all-pass filter in the form of a Fabry-Perot filter.



9. Applicant's arguments filed 4/1/04 have been fully considered but they are not persuasive. The applicant argues that the independent claims are patentably distinct from the cited references. The examiner disagrees. First, the applicant argues that the Karzinov is silent regarding matching the free spectral range of an all-pass filter to the regular repetition rate of an input optical pulse. However, Karzinov clearly discloses such a concept in column 11 lines 31-67. Furthermore, the applicant's claim language only requires that the all-pass filter of Karzinov be "configured" in same manner as that claimed in order to produce the same result. Clearly, the all-pass filter of Karzinov could have been configured as claimed since Karzinov discloses as much in column 11 lines 31-67. Moreover, Harvey clearly teaches that the concept claimed by the applicant is well known in the art (Figure 2). Harvey specifically teaches that the "free spectral range is essentially equal to the pulse repetition rate." The examiner see no difference between this disclosure by Harvey and the applicant's claim that the free-spectral range, as defined by the spacing between the delay peaks, is matched to the repetition rate of the input optical pulse. Clearly, the applicant's claim to "matched" can be viewed as equivalent to Harvey's "essentially equal." Figure 2 of Harvey further supports the examiner's position.

The applicant also contends that the cited references fail to address synchronization of high-speed transmission signals with low speed control signals. However, the examiner respectfully points out that this limitation is only in claim 15 and not the other independent claims. Claim 15 is only rejected by the double-patenting rejection. Furthermore, the all-pass filter of the combination of Harvey and Karzinov could clearly have been applied to a multitude of signals including control signals.

Next, the applicant contends that Harvey's etalon filter cannot be considered an all pass filter. However, the examiner disagrees. Since the system and filter of Harvey produce the same

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result as the claimed invention, it is clear that the filter of Harvey can indeed be considered an all-pass filter.

10. In response to applicant's argument that the cited references fail to teach that the all-pass filter is configured to match the free-spectral range of the filter with the repetition rate of the input signal, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

#### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sugden and Ip disclose relevant art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Agustin Bello  
Examiner  
Art Unit 2633

AB

A handwritten signature in black ink, appearing to read "A. Bello". The signature is written in a cursive, flowing style.